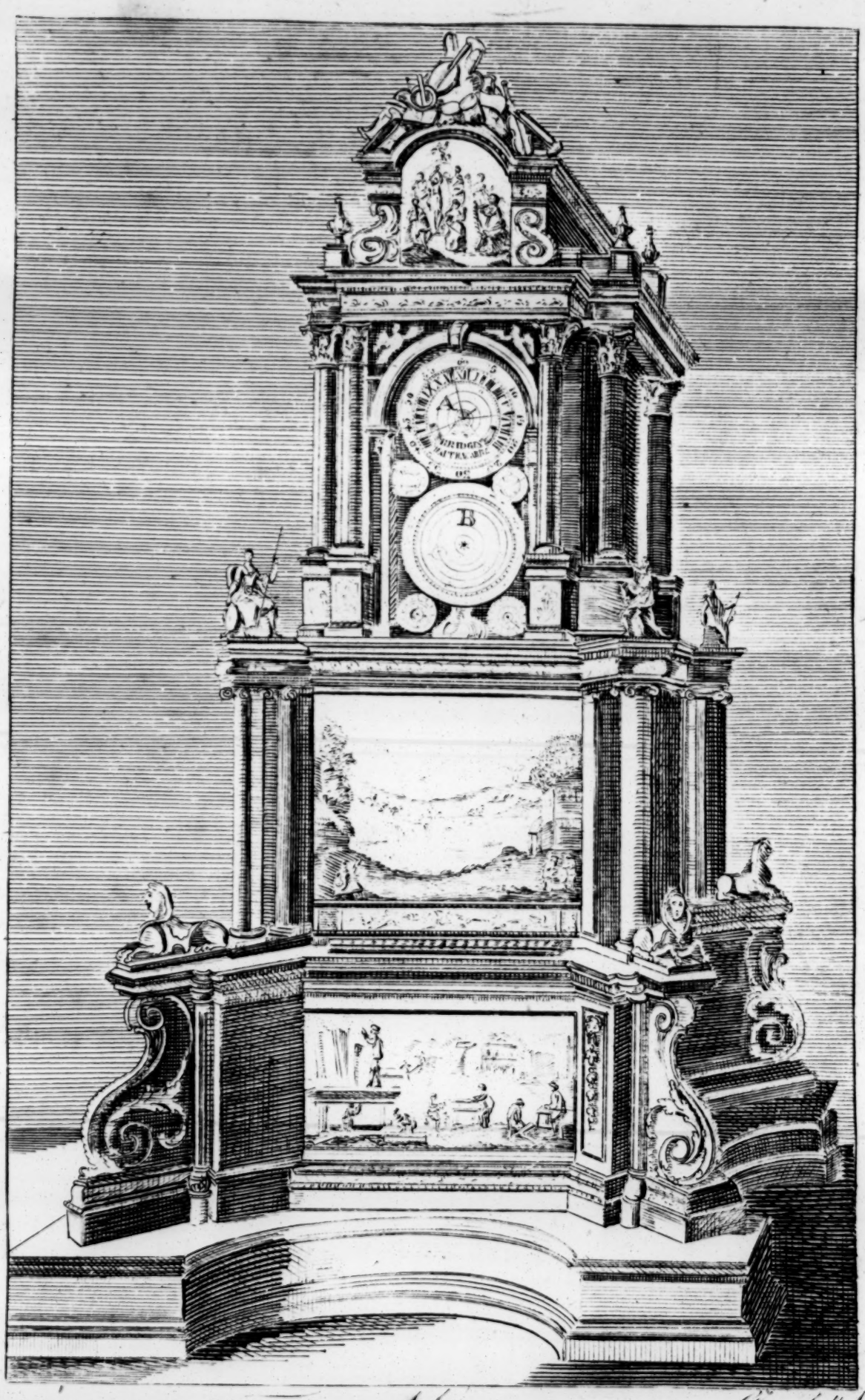

The Microcosm? Clowes Sculpt.

Bridges (H.) K

A SUCCINCT DESCRIPTION

OF THAT

Elaborate and Matchleſs PILE of ART,

CALLED, THE

MICROCOSM;

WITH A SHORT ACCOUNT OF THE

SOLAR SYSTEM:

INTERSPERSED WITH

POETICAL SENTIMENTS

ON THE

PLANETS.

Extracted from the moſt approved AUTHORS on that SUBJECT.

THE TWELFTH EDITION, WITH ADDITIONS.

LONDON:

PRINTED FOR THE PROPRIETOR, MR. EDWARD DAVIS.

M.DCC.LXXIII.

[PRICE SIX-PENCE.]

TO THE

READER.

IN juſtice to the memory of the late Mr. HENRY BRIDGES, *of* WALTHAM-ABBEY, *Architect, I muſt inform the reader, that the* MICROCOSM *was conſtructed by that excellent Artiſt. It was the produce of more than twenty years cloſe ſtudy and application; and, when compleated, it received the approbation of the nobility, the royal ſociety, the gentry, and the curious part of mankind in general.*

We preſume it is needleſs to apologize for an attempt to make ſome profit from a work, which has been ſo long bringing to perfection, and which has been attended with ſuch prodigious expence; for it would be impracticable for a private perſon to beſtow ſo much time and money in the purſuit of mechanic powers and operations, if he did not expect public encouragement, for what ſo manifeſtly tends both to the entertainment and improvement of mankind.

A deſcription of this inimitable piece of art muſt be acceptable to every perſon, who has any degree of curioſity; for it is a work of ſuch complicated contrivance, and affords ſuch a variety of repreſentations, that the moſt fertile imagination is unable to form an adequate idea of it; and it is at the repeated requeſt of ſeveral perſons of diſtinction, who have honoured the proprietor with their inſpection and approbation, that this deſcription of the MICROCOSM *is publiſhed.*

A PARODY

A

PARODY

ON

POPE's PROLOGUE to CATO.

ADDRESSED TO THE LATE

Mr. HENRY BRIDGES,

Conſtructor of that Elaborate Piece of Mechaniſm,

CALLED, THE

MICROCOSM.

By the late Dr. BURTON, of YARMOUTH.

TO ſooth the ſoul by tender ſtrokes of art,
To raiſe the genius, and to rouſe the heart,
To make mankind by harmony elate,
Soften the breaſt, and baniſh direful hate,
The ruffled paſſions potent to aſſwage,
To conquer fear, and to enervate rage,
Was Muſic's power, by Orpheus firſt ordain'd;
Fierce beaſts were tam'd, and fiercer tyrants chain'd.
Th' enchanting ſounds through their whole fabric crept,
And ſavage mortals wonder'd why they wept.

Our

Our artiſt ſhuns by vulgar ſprings to move
His mimic race below, or orbs above.
Here pleaſure flows from Scientific cauſe,
Whilſt ingenuity extorts applauſe:
He bids your breaſt with emulation riſe,
And tho' you're e'er ſo learned, e'er ſo wiſe,
By arts Mechanic you will here be taught
More than Rome knew, or Grecian ſages thought.
Thoſe objects to your ſenſes he diſplays,
Which the ſpectator of our globe ſurveys;
The various movements and the changing ſtate
Of beings active and inanimate.
Whilſt BRIDGES gives his MICROCOSM laws,
What boſom beats not in invention's cauſe?
Who ſees him work, but envies ev'ry deed?
Who hears him lecture, hears ev'n Newton read.
Britons attend; be worth like his approv'd,
And ſhew you have the virtue to be mov'd.
With honeſt ſcorn our wond'rous Artiſt view'd
Meer machinations on the world obtrude;
French and Italian puppets pleas'd too long,
And Engliſh ſenſe was barter'd for a ſong;
Dare to invent yourſelves, to Fame aſpire,
Be juſtly warm'd with own native fire.
BRIDGES! thoſe ſounds muſt raviſh ev'ry ear,
Which Handel's ſelf did not diſdain to hear.

A SUCCINCT
DESCRIPTION
OF THE
MICROCOSM.

THE MICROCOSM is built in the form of a Roman Temple. It is ten feet high, ſix broad in the baſis, and conſiſts of five principal parts. It is moſt beautifully compoſed of Architecture, Sculpture, Painting, Muſic and Aſtronomy, according to the moſt approved rules and principles; and contains an infinite variety of moving figures, whoſe motions are a judicious repreſentation of life. The beauties of its internal parts are calculated to delight the eye, pleaſe the ear, and improve the mind; its external, to ſtrike every beholder with admiration, at the regularity and magnificence of its ſtructure.

At the top of this machine are three beautiful ſcenes, which change alternately.

The firſt is a curious repreſentation of the * Muſes, on the hill Parnaſſus †. They appear playing in concert, on various muſical inſtruments; as the harp, hautboy, flute, baſs-viol, &c. Pegaſus is likewiſe at

* They were ſuppoſed the daughters of Jupiter and Mnemoſyne. Their names are Calliope, who preſides over muſic; Clio, over hiſtory; Erato, over love; Thalia, over comedy; Melpomene, over tragedy; Terpſichore, over dancing; Euterpe, over muſical inſtruments; Polyhymnia, over memory; and Urania, who preſides over aſtronomy.

† Parnaſſus is a mountain of Antient Greece, now European Turkey, and is ſituated in Livadia, north of the gulph of Lepanto. Its high top appearing in two points at Delphos (the preſent Caſtro) occaſioned its being called 'Biceps Parnaſſus. Nec in bicipite ſom-'niaſſe Parnaſſo.'——A ſpring riſes below the cleft, which is imagined

at the top of the hill, and ſeems to fly. The whole is highly finiſh'd, the attitudes ſtriking, and the motions are a juſt reſemblance of life.

The ſecond ſcene is a delightful foreſt, in which are repreſented a great variety of wild beaſts. In this foreſt * Orpheus is ſeen playing on his lyre, and beating exact time to each tune; and the beaſts, as tho' charmed by his excellent harmony, ſeem to expreſs their admiration by various motions. This piece is executed with great judgment, and affords the judicious a very agreeable entertainment.

The third ſcene is a beautiful grove, a proſpect inexpreſſibly pleaſing, calculated to chaſe away melancholy, and inſpire ſerenity of mind. Here are birds flying, and, in various other motions, warbling forth their melodious notes, and producing a ſweet harmony. The whole is adapted with great propriety to entertain both the eye and the ear, and to produce pleaſing ideas in the imagination.

In the centre of this magnificent ſtructure, under a grand arch of the Corinthian order, ſtands a large clock, which is divided into two aſtronomical ſyſtems †, one above the other, as may be ſeen in the frontiſpiece at A and B.

The

gined to be the antient 'Fons Caſtalius;' where the Pythean propheteſs, and the poets, who pretended to inſpiration, uſed to bathe and drink the waters.

* He was reckoned the ſon of Apollo and Calliope, and is celebrated by the poets for the power and ſweetneſs of his muſic.—The fiction of his charming the wild beaſts, and of his going into the infernal regions to fetch his wife Eurydice, are well known.

† Aſtronomy is a noble ſcience, worthy the knowledge of the fair ſex, and highly deſerving more than the following encomium of the poet:

Aſtronomy!

The uppermoſt ſyſtem at A, is called the Ptolemaic * ſyſtem; where the Earth repreſents the centre of motion, with an hour-circle round it, and the Sun and Moon revolve round every twenty-four hours. This is indeed an erroneous ſyſtem, and now quite exploded; as it ſhews not the real, but apparent motion of the Sun and Moon. Accordingly it ſhews the riſing, ſouthing and ſetting of the Sun, which always points out the hour of the day throughout the whole year, and riſes and ſets at the ſame time as it really does in the heavens: For there are two blue circular plates, called horizons, one on the left-hand, and the other on the right, which riſe and fall according to the lengthening or ſhortening of the days, in order to regulate the Sun's riſing and ſetting; ſo that as the Sun goes round in twenty-four hours (being within the hour-circle) it paſſes by every hour on the plate, and points out the time of the day. In order to tell the time in the night after the Sun is ſet, there is an hour-hand placed directly oppoſite to the Sun, alſo a minute and ſecond-hand, all on one centre; ſo that the time of the day, or night, may be as eaſily known by this, as any other clock. There are two other hands on this centre, beſides thoſe before deſcribed; one called the Moon's

 nodes,

Aſtronomy! Hail Science heavenly born!
Thy ſchemes the life aſſiſt, the mind adorn:
Thy aids the heav'ns ſeal'd volumes wide impart,
And taught the ſeaman firſt his uſeful art;
Gave changing ſeaſons their determin'd ſpace,
And fix'd to hours and years their meaſur'd race.

* The Ptolemaic ſyſtem was invented by Claudius Ptolemaeus, a celebrated aſtronomer and mathematician of Peluſium, in Egypt. He lived in the beginning of the ſecond century.

nodes, which ſhews the time of the eclipſes; and the other the equation of time, or the difference between the Sun and the clocks.

There are alſo two leſſer horizons within thoſe of the Sun, to regulate the riſing and ſetting of the Moon, in the ſame manner as thoſe of the Sun. The Moon ſhows the time of new and full, her increaſe and decreaſe; always repreſenting the ſame figure as it really is in the heavens, and does actually riſe and ſet at the ſame time.

But as this ſyſtem is found to be falſe, and is now exploded, as before obſerved, the * Copernican, or true ſolar ſyſtem, is placed under it at B; and plainly demonſtrates, that the Sun is a fixed body, and the Earth a moveable one. This ſyſtem is compoſed of ſeventeen bodies, in the centre † of which is placed that immenſe globe of fire, the Sun ‡, ſhewing his rotation upon his own axis from weſt to eaſt, once in twenty-five days ſix hours; and his diameter is above eight hundred thouſand miles, which is ſaid to be a million of times larger than the Earth---Thus the poet ſings the glory of the Sun:

Around the Sun the planets orbs are hurl'd,
The centre, eye, and glory of the world.

See

* This ſyſtem was invented by that Grecian ſage Pythagoras, and taught by him about 548 years before Chriſt; but after his death it lay dormant, 'till it was reviv'd by Nicholas Copernicus, a famous aſtronomer and mathematician of Thorn, in Pruſſia Royal. He was born in that city on the 19th of January, 1473.

† As the paths which the ſeveral planets deſcribe in their revolutions round the Sun are not circles but ellipſes, the Sun is not, in reality, placed in the centre, but in one of the Foci of their reſpective orbits.

‡ By ſome late calculations of a learned profeſſor of mathematics, the Sun is two million ſeven hundred and thirty-ſeven thouſand five hundred and thirty-ſeven times as large as the Earth.

See from his orb, array'd in all its pride,
A ſpreading luſtre ſtreams on every ſide,
And in a moment gilds the mighty void!
His orb ſo rich, his beams ſo ſwift and bright,
Proclaim the God that made him, infinite!

Thus the poet deſcribes the order of the ſolar ſyſtem:

This wide machine the univerſe regard,
With how much ſkill is each apartment rear'd!
The Sun, a globe of fire, a glowing maſs,
Hotter than melting flint, or fluid glaſs,
Of this our ſyſtem holds the middle place.
Mercurius neareſt to the central Sun,
Does in an oval orbit circling run,
But rarely is the object of our ſight;
In ſolar glory ſunk, and more prevailing light.
Venus the next, whoſe lovely beams adorn
As well the dewy eve as opening morn,
Does her fair orb in beauteous order run.
The Globe terreſtrial next, with ſlanting poles,
And all its pond'rous load unwearied rolls.
Then we behold bright planetary Jove,
Sublime in air thro' his wide province move:
Four ſecond planets his dominion own,
And round him turn, as round the Earth the Moon.
Saturn, revolving in the higheſt ſphere,
With ling'ring labour finiſhes his year.

This ſyſtem, in the machine, is a true repreſentation of the heavens; for they all move round in their periodical times, always correſponding with the heavenly bodies; that is, they are ſeen in the ſame ſigns of the zodiack here, as they are in the heavens, provided the clock is kept going. Their times of revolution are as follow:

MERCURY, the neareſt planet to the Sun, * goes round him in eighty-ſeven days twenty-three hours

* Firſt Mercury, amidſt full tides of light,
Rolls next the Sun, thro' his ſmall circle bright:
All that dwell there muſt be refin'd and pure;
Bodies, like ours, ſuch ardour can't endure.
Our Earth would blaze beneath ſo fierce a ray,
And all its marble mountains melt away.

of our terreſtrial time, which is the length of his year: but his vicinity to the Sun renders him very ſeldom to be ſeen; and no ſpots appearing on his disk, the time of his rotation on his axis, or length of his days and nights, is to us unknown. His diſtance from the Sun is thirty-two millions of miles. * He is in diameter two thouſand four hundred and ſixty miles, which is about the thirtieth part of our Earth. He moves one hundred thouſand miles in his orbit every hour (a moſt inconceivable velocity indeed!) His light and heat are ſeven times as much as ours, and the Sun appears ſeven times as large to him as it does to us.

Fair Venus next fulfils her larger round,
With ſofter beams and mighty glory crown'd;
Friend to mankind, ſhe glitters from afar,
Now the bright ev'ning, now the morning ſtar. Univerſe.

VENUS is diſtant from the Sun fifty-nine millions of miles; and, moving at the rate of ſeventy thouſand miles every hour, finiſhes her annual circuit in two hundred and twenty-four days and ſeventeen hours, in which time ſhe has only nine days and a quarter. She is computed to be a globe of ſeven thouſand nine hundred and ſix miles in diameter, ſo that there is very little difference between the bulk of the Earth and this planet. Her light and heat from the Sun are double that of the Earth's. This planet made a tranſit over the Sun's disk the ſixth of June, one thouſand ſeven hundred and ſixty-one; when ſhe appeared like a large beauty ſpot on a lady's face. She

* By the new calculations, Mercury is forty-five million eight hundred and eighty-one thouſand nine hundred and eighty-four miles from the Sun, and paſſes thro' two thouſand two hundred and ſeventy-five miles in a minute, in his annual courſe.

She made another tranſit over the Sun the ſixth of June, one thouſand ſeven hundred and ſixty-nine.

More diſtant ſtill our Earth comes rolling on,
And forms a wider circle round the Sun;
With her the Moon, companion ever dear!
Her courſe attending thro' the ſhining year.

The Earth is eighty-one millions of miles from the Sun *; which is ſuch a convenient ſituation in the ſyſtem, with reſpect to light and heat, as admits of no exceſs of either †.

The Earth is in diameter ſeven thouſand nine hundred and ſixty miles ‡, and makes its revolution round the Sun from weſt to eaſt in one year, or three hundred and ſixty-five days five hours and forty-nine

* By the new calculations, the Earth is one hundred and eighteen million five hundred and forty-one thouſand four hundred and twenty-eight miles from the Sun; and paſſes thro' one thouſand four hundred and fifteen miles in a minute, in her annual courſe.

† See how the Earth has gain'd that very place,
Which, of all others in the boundleſs ſpace,
Is moſt convenient, and will beſt conduce
To the wiſe ends requir'd for nature's uſe.
You, who the MIND and CAUSE SUPREME deny,
Nor on his aid to form the world rely,
Muſt grant, had perfect wiſdom been employ'd
To find, thro' all th' interminable void,
A ſeat moſt proper, and which beſt became
The Earth and Sea, it muſt have been the ſame.
Blackmore's Creation.

‡ Mr. WHISTON tells us, that if we compute the true magnitude or quantity of matter in the Earth, it will appear, upon a moderate eſtimate, that ſhe is not the two hundredth part ſo large as Jupiter, nor the ninetieth ſo large as Saturn, nor the two hundred and twenty thouſandth ſo large as the Sun. [By the new calculations, the quantity of matter in the Sun is ſix hundred eighty-two thouſand four hundred and ſixty-four times as much as the quantity of matter in the Earth.] So that ſhe is very inconſiderable, if compared with the reſt of the ſolar ſyſtem; and much more ſo, if with the whole univerſe, or ſyſtems of the fixed ſtars: in the elegance of the prophetic expreſſions, 'As a drop of a bucket, as the ſmall duſt 'of a balance, yea, leſs than nothing and vanity.' Inſomuch, that if it was poſſible for the whole ſolar ſyſtem to be annihilated, it would not be miſſed more than a grain of ſand from the ſea ſhore.

nine minutes (that being an equal tropical year) and moves at the rate of fifty-eight thouſand miles every hour, which is one hundred times ſwifter than a cannon-ball. It turns upon it's axis in every twenty-four hours, at the rate of one thouſand and forty-two miles in an hour, which is the cauſe of day and night, and the riſing and ſetting of all the heavenly bodies; and the Earth's axis is always inclined twenty-three degrees and an half from the axis of it's orbit, which is the cauſe of our days and nights being longer at one time of the year than the other, and of the returns of the Seaſons.

The MOON is diſtant from the Earth about two hundred and forty thouſand miles; * ſhe revolves round the Earth, from weſt to eaſt, once in twenty-ſeven days ſeven hours and forty-four minutes; and, above all the reſt of the planets, reſpects the Earth as the centre of her orbit. She has ſomething very peculiar in her movement; for ſhe makes but one revolution on her own axis in the ſame time that ſhe goes round the Earth, always keeping the ſame face, or ſpots † towards us; ſo that a day and a night with the Moon is as long as a lunar month with us, which can be ſaid of no other planet in our ſyſtem. She is in diameter two thouſand one hundred and ſeventy-five miles, which is about fifty times leſs than the Earth.

MARS

* By the new calculations, the Moon is two hundred and thirty-nine thouſand and twenty-ſeven miles from the Earth.

† Regard the ſpots which mark the lunar face,
Her figure changing in her monthly race;
A creſcent now, but feebler light ſhe yields;
Now half her diſk her bounteous brother gilds,

Now

MARS is one hundred and twenty-three millions of miles * from the Sun, which is half as far again as the Earth; and by moving at the rate of forty-five thouſand miles every hour in his orbit, makes one revolution round the Sun in one year three hundred and twenty-two days and ſeventeen hours, which is one year with the inhabitants of this planet. He is in diameter four thouſand four hundred and forty-four miles, which is almoſt ſix times leſs than the Earth, and turns round his axis in twenty-four hours and forty minutes, which is the length of his natural day. His light and heat are equal but to half of ours. If he has any Moon to attend

Now riſing in the eaſt, full-orb'd ſhe glows,
And o'er the night her ſilver mantle throws.
The roughneſs on her broken edge reveals
Her ſurface maſk'd with vales and painted hills;
Her brighter parts, the SAGE mountainous deems;
Her darker; oceans, ſeas and ample ſtreams.

Mr. BROWN.

The beauty of a fine MOON-LIGHT NIGHT deſcribed.

So when the Moon, refulgent lamp of night,
O'er heav'n's clear azure ſpreads her ſacred light;
When not a breath diſturbs the deep ſerene,
And not a cloud o'ercaſts the ſolemn ſcene;
Around her throne the vivid planets roll,
And ſtars unnumber'd gild the glowing pole;
O'er the dark trees a yellow verdure ſhed,
And tip with ſilver ev'ry mountain's head:
Then ſhine the vales, the rocks in proſpect riſe,
A flood of glory burſts from all the skies:
The conſcious ſwains, rejoicing in the ſight,
Eye the blue vault, and bleſs the uſeful light.

POPE's Homer.

* By the new calculations, Mars is eighty-five million ſeven hundred forty-four thouſand five hundred and twelve miles from the Sun; and paſſes through one thouſand one hundred and forty-ſix miles in a minute, in his annual courſe.

attend him, ſhe muſt be very ſmall, for our beſt teleſcopes have not been able to diſcover it.

See Mars alone runs his appointed race,
And meaſures out exact his deſtin'd ſpace;
Nor nearer does he wind, nor further ſtray,
But finds the point whence firſt he roll'd away.
Univerſe.

This planet is very eaſily known from the reſt, for he appears but ſmall, and of a flame colour.

Yet more remote from day's all-cheering ſource,
Large Jupiter performs his conſtant courſe:
Four friendly moons, with borrow'd luſtre, riſe,
Beſtow their beams benign, and light his skies.
Univerſe.

JUPITER is the next in courſe, and the largeſt of all the planets, even larger than all the reſt put together *, the Sun excepted, being in diameter eighty-one thouſand one hundred and fifty-five miles, which is above one thouſand times larger than our Earth. He is four hundred and twenty-four millions of miles † from the Sun, which is almoſt ſix times farther than the Earth; and, by moving at the rate of twenty-four thouſand miles every hour, finiſhes his annual period in eleven years three hundred and thirteen days and fifteen hours.

Jupiter

* Then Jove, prodigious planet of the skies!
His orb preſents, of huge amazing ſize;
In bulk none equals his enormous maſs;
The whole joint ſyſtem his contents ſurpaſs.

† By the new calculations, Jupiter is ſix thouſand one hundred and ſixty-five million three hundred and ninety-nine thouſand and forty-four miles from the Sun; and paſſes through ſix hundred and twenty miles in a minute, in his annual courſe; and is two thouſand ſeven hundred and ſeven times as large as the Earth.

Jupiter turns once upon his own axis every nine hours and fifty-ſix minutes (which muſt make his days and nights extremely ſhort, in compariſon to ours) on which account the diurnal velocity of his equatorial parts exceeds the ſwiftneſs * wherewith he moves in his orbit; which appears to us a ſingular circumſtance. The ſmall quantity of light and heat he derives from the Sun, which is but one twenty-eighth part of ours, is compenſated by its quick returns, and by his four moons, † none of them leſs than our Earth, which revolve round him: ſo that there is ſeldom any part of this huge planet but is enlightened by one or more of them, excepting near the poles, where there is no need of them; becauſe the Sun conſtantly circulates in or near their horizon, without ſetting.

The firſt, or neareſt ſatellite, revolves round Jupiter in one day eighteen hours and thirty-ſix minutes:

The ſecond in three days thirteen hours and fifteen minutes:

* In ample compaſs Jove conducts his ſphere,
And later finiſhes his tedious year;
Yet ſwiftly, on his axle turn'd, regains
The frequent aid of day to warm his plains.

† For ſignal honour made, behold! afar
Four radiant moons ſurround th' imperial ſtar,
(Large as our boaſted world) whoſe ſilver light
Refreſh his regions in the gloomy night;
Nor this the fancy of deluded eyes,
Mark'd are their periods thro' ſublimer skies.
Oft does the aſtronomer his tube diſplay,
And view them in eclipſe with pleas'd ſurvey.
To this the curious their diſcovery owe
Of light's ſwift motion, and its meaſure know.

The third in ſeven days three hours and fifty-nine minutes:

And the fourth, and outwardmoſt, in ſixteen days eighteen hours and an half.

This planet, ſeen from its neareſt moon, appears one thouſand times as large as our Moon does to us, taking up a ſixth part of the viſible heavens; increaſing and decreaſing in all the ſhapes of our Moon, every thirty-ſix hours and an half. By the eclipſes of theſe moons, which happen in every revolution round Jupiter, aſtronomers have not only diſcovered that light comes from the Sun to us in ſeven minutes and an half; but have alſo determined the longitude of places on the Earth, with greater certainty and facility, than by any other method yet known.

SATURN, the remoteſt * of all the planets in our ſyſtem,

* Fartheſt and laſt, ſcarce warm'd by Phœbus' ray,
Through his wide orbit Saturn wheels away.
How great the change, could we be wafted there!
How ſlow the ſeaſons! and how long the year!
From hence, how large, how ſtrong the Sun's bright ball!
But, ſeen from thence, how languid, and how ſmall!
When the keen North, with all its fury, blows,
Congeals the floods, and forms the fleecy ſnows,
'Tis heat intenſe, to what there can be known;
Warmer our poles, than is its burning zone.
Who there inhabits muſt have other powers,
Juices and veins, and ſenſe, and life, than ours:
One moment's cold, like theirs, would pierce the bone,
Freeze the heart's blood, and turn us all to ſtone. ——
Strange and amazing muſt the diff'rence be,
'Twixt this dull planet and bright Mercury; †
Yet reaſon ſays, nor can we doubt at all,
Millions of beings dwell on either ball,
With conſtitutions fitted for that ſpot,
Where Providence, all-wiſe, has fix'd their lot.

† It is computed that the heat which Mercury continually receives from the Sun, would make water boil on the ſurface of the Earth; and, were he not a very denſe body, he would be calcined by the ſolar heat.

ſyſtem, is ſeven hundred and ſeventy-ſeven million of miles * from the Sun, which is almoſt ten times farther than our Earth, and makes his light and heat ninety times leſs than ours; and, moving at the rate of eighteen thouſand miles in every hour, makes one revolution round the Sun in twenty-nine years one hundred and ſixty-ſeven days ten hours, which makes only one Saturnian year. He is in diameter ſixty-ſeven thouſand eight hundred and ſeventy miles, which is ſix hundred times larger than the Earth, and little more than half the largeneſs of Jupiter. He is ſurrounded by a broad ring †, encompaſſing his body as a horizon does a globe; the breadth of which is twenty-one thouſand miles, equal to its diſtance from Saturn.

This planet is ſaid to be ſix hundred and ſix million of miles above the Earth ‡, ſo that the Sun ap-

 pears

* By the new calculations, Saturn is one thouſand one hundred and thirty million nine hundred and eleven thouſand ſix hundred and forty-four miles from the Sun; and paſſes through four hundred and fifty-eight miles in a minute, in its annual courſe; and is one thouſand three hundred and fifty-three times as large as the Earth.

† Muſe! raiſe thy voice, myſterious truths to ſing,
How o'er the copious orb a lucid ring,
Opaque and broad, is ſeen its arch to ſpread,
Round the big globe at ſtated periods led:
Perhaps (its uſe unknown) with gather'd heat
To aid the regions of that gelid ſeat,
The want of nearer Phœbus to ſupply,
And warm with reflex beams his ſummers ſky;
Elſe might the high-plac'd world, expos'd to froſt,
Lie waſte in one eternal winter loſt.

‡ Theſe diſtances appear amazing, and ſeem to confound our ideas of ſpace; yet they are but trifling, if compared with the diſtance of the

pears only one ninetieth part ſo large to us; therefore his light and heat muſt be diminiſhed in proportion to its diſtance, which muſt be ninety times leſs than with us: but, in order to make up for that deficiency, he has five ſatellites revolving round him, all in different periods of time, and all on the outſide of his ring (what this ring is, or what uſe it is for, we will not pretend to ſay; but his moons, we have good reaſon to believe, reflect light on him in the Sun's abſence as our Moon does on us, ſo that he is very ſeldom without light:) the revolutions of his moons are as follow:

The firſt makes his revolution in one day twenty-one hours and eighteen minutes:

The ſecond in two days ſeventeen hours and forty-one minutes:

The third in four days twelve hours and twenty-five minutes:

The fourth in fifteen days twenty-one hours and forty-one minutes:

The

the fixed ſtars. Mr. Huygens tells us, that the Dog-ſtar (which is the largeſt, and conſequently the neareſt) appears twenty-ſeven thouſand ſix hundred and ſixty times leſs than the Sun, and therefore muſt be above two million of millions of miles from us! Stupenduous diſtance! So great that a cannon-ball would ſpend near ſeven hundred thouſand years in flying thither, with the ſame velocity it has at the cannon's mouth; which is a great proof of their immenſe bigneſs, and that they ſhine with their own native light, or elſe they could never be viſible to us at ſuch a diſtance. Thus the poet:

Thus has the muſe, but with a tranſient view,
Roam'd the wide circuit of our ſyſtem through;
But millions more the Pow'r Divine has plac'd;
Millions of Suns with circling planets grac'd;
Suns large as ours, to th' unaided ſight,
Points ſcarce diſtinguiſh'd in the train of night.
The ball, which ſwiftly from the cannon flies,
Piercing with equal ſpeed the yielding ſkies,
Amazing thought! ſeven hundred thouſand years
Muſt travel, e'er it reach theſe diſtant ſpheres.

The fifth in ſeventy-nine days ſeven hours and forty-eight minutes.

It is ſuppoſed that if the centrifugal force were taken away, and the planets left entirely to the action of the centripetal power, they would all be drawn into the Sun, as follow: Mercury in the ſpace of fifteen days thirteen hours; Venus in thirty-nine days ſeventeen hours; the Earth in ſixty-four days ten hours; Mars in one hundred and twenty-one days; Jupiter in two hundred and ninety; and Saturn in ſeven hundred and ſixty-ſeven, or little more than two years.

Their orbits, in this machine, are not circles, but ellipſes, and have all their due inclinations, agreeable to their different latitudes; that is, they lie in different planes: ſo that we may juſtly ſay, this machine always ſhews a true repreſentation of the heavenly bodies.

But as theſe planets always move in this ſyſtem correſpondent with the heavenly bodies, their motions become ſo very ſlow, that they are imperceptible, (for they all move in their periodical times, as before deſcribed) therefore we open a pair of folding doors underneath, which diſcovers four other ſyſtems, (two large and two ſmall) where their motions are more diſcernable.

The firſt, on the left-hand, is the SOLAR SYSTEM, which repreſents the planets in their proportionable magnitude to each other, and performing their annual and diurnal revolutions at the ſame time, and at their proportionable diſtance from each other.

The

The other large one, on the right-hand, is a ſyſtem of Jupiter and his four moons, where they all move round him in their different periods of time, as before deſcribed, which renders the doctrine of ſatellites very eaſy to be underſtood----They ſhew the immerſion and emerſion with Jupiter's body, and the nature of the eclipſes among themſelves.

The uppermoſt of the two ſmalleſt ſyſtems, is to ſhew the nature of the eclipſes of the Sun and Moon; and ſhews that no eclipſe * of either can happen but at a new or full Moon: and why they do not happen every new or full Moon, is, becauſe the Moon's orbit lies oblique to the plane of the Earth's ecliptic; that is, one half of the Moon's orbit is above, and the other half below the Earth's, croſſing it in two oppoſite points, called the Moon's nodes; and the nodes, or points of interſection with the Earth's path, have a motion through it, contrary to the order of the ſigns; otherwiſe, if the Moon's orbit or path lay in the ſame plane with the Earth's, there would be an eclipſe of the Sun every new Moon, and an eclipſe of the Moon at every full; becauſe the two bodies, the Earth and the Moon, would be in a right line with the Sun.

The other ſmall ſyſtem, is to ſhew the ſtationary and retrograde motion of the planets, and plainly proves

* As many people are terrified at the appearance of an eclipſe, which, they imagine, portend ſome dire event, and frighten others who are unacquainted with the cauſe; it may not be amiſs here to obſerve, that there is nothing at all extraordinary in it: for an eclipſe of the Sun is nothing more than the Moon's paſſing between the Sun and the Earth, ſo as the ſhadow of the Moon falls upon the Earth in paſſing by it; and an eclipſe of the Moon is cauſed by the Earth's being between the Sun and the Moon.

proves the Earth's annual motion; a ſcheme too difficult to be eaſily comprehended in lines, but is rendered very obvious and intelligible by this machine.

There is another piece of mechaniſm, independent of this machine, which is placed on the right-hand ſide. This exhibits the trajectory and type of the COMET *, whoſe appearance was ſo much looked for in one thouſand ſeven hundred and fifty-eight, but did not appear 'till one thouſand ſeven hundred and fifty-nine. It ſhews the elliptical figure of the Comet's orbit; the accelerating and decreaſing of its velocity; the lengthening and ſhortening of its tail; its near approach to the Sun; its aphelion and perihelion; and its moving through the arches of equal areas in equal times.

The

* The phænomenon of COMETS, or BLAZING STARS, generally ſpreads terror and amazement, and, whenever they are ſeen, afford ſuch a ſingular appearance as affects the ſpectators with wonder and aſtoniſhment: yet they are not to be deemed deſtructive, but rather conſervators of the planetary ſyſtem; for their tails are ſuppoſed to be prodigious quantities of fume and vapours, flying off from the bodies of the Comets, as they become more and more heated in their approach to the Sun, and are found by actual meaſurement to be thirty or forty millions of miles, ſome of them ſeventy or eighty millions in length, when neareſt the Sun. Some imagine they are diſperſed about the planetary ſyſtem, in ſuch a manner as to ſupply the planets with moiſture; which they ſuppoſe continually decreaſes by vegetation, putrefaction, &c. and they are found to run through very great extremes, both of heat and cold; for aſtronomers tell us, that the Comet of one thouſand ſix hundred and eighty went ſo near the Sun as to become heated two thouſand times hotter than red-hot iron, and from thence it went to the diſtance of eleven thouſand millions of miles, which is fourteen times farther than the orbit of Saturn, the boundary of the planetary ſyſtem, and ſeventeen thouſand times colder than our frigid zone. Theſe great extremities have occaſioned many to think they are appointed as the places of torment, or hells, for the wicked.—Thus the poet:

Who can the Comet's wond'rous journey tell?
Seats not unaptly deem'd the place of hell.
Now burning in the Sun's immediate beams;
More frigid now than Greenland's frozen ſtreams.
Of all GOD's works, our reaſon nothing ſhews,
So fitly form'd for torments and for woes.

The Comets are ſolid opaque bodies, with long tranſparent trains or tails iſſuing from the ſide which is turned from the Sun *. They move about the Sun in very excentric ellipſes, and are of a much greater denſity than our Earth; for ſome of them, in every period, are heated to ſuch a degree, as would vitrify or diſſipate any ſubſtance known to us. It is thought there are at leaſt twenty-one belonging to our ſyſtem, but the periods only of three are known, with any degree of certainty. The firſt of theſe appeared in the years one thouſand five hundred and thirty-one, one thouſand ſix hundred and ſeven, and one thouſand ſix hundred and eighty-two; and was expected to appear again in one thouſand ſeven hundred and fifty-eight, and every ſeventy-fifth year afterwards. The ſecond of them in one thouſand five hundred and thirty-two, and one thouſand ſix hundred and ſixty-one; and ſo may be expected to return in one thouſand ſeven hundred and eighty-nine, and every one hundred and twenty-ninth year after. The third, having laſt appeared in one thouſand ſix hundred and eighty, and its period being no leſs than five hundred and ſeventy-five years, cannot return until the year two thouſand two hundred and fifty-five. This Comet, at its greateſt diſtance

* At his command, affrighting humankind,
Comets drag on their blazing lengths behind;
Nor, as we think, do they at random rove,
But in determin'd times, through long ellipſes, move;
And though ſometimes they near approach the Sun,
Sometimes beyond our ſyſtem's orbit run,
Throughout their race they act their Maker's will,
His pow'r declare, his purpoſes fulfil.

tance from the Sun, is ten thouſand eight hundred and ſeventy-eight millions of miles beyond Saturn's orbit; and at its leaſt diſtance, which is four hundred and ninety thouſand miles, the Sun, as ſeen from it, appears one hundred degrees in breadth, and conſequently forty thouſand times as large as he does to us *.

This imperfect ſketch of the mundane ſyſtem, we think ſufficient to perſuade us, that to conſider our Earth as the only habitable planet, would be derogating from thoſe auguſt and magnificent ideas, which the amazing amplitude of the univerſe muſt neceſſarily excite in every contemplative mind: in every part of the creation, there appears an admirable manifeſtation of infinite wiſdom and power; every thing ſuited to its proper purpoſe; or, as philoſophers ſay, 'Nature does nothing in vain:' it cannot therefore be thought conſiſtent with the wiſdom of the divinity, to ſuppoſe that ſuch a prodigious number of bodies, as we are aſſured the heavens contain, ſhould be created for no other ends than what may be attributed to the Earth.

* It may ſeem unaccountable to an unlearned reader, that aſtronomers ſhould ſpeak ſuch amazing things, and ſpeak them with ſuch an air of aſſurance, concerning the diſtances and magnitudes, the motion and relations of the heavenly bodies.—I would deſire ſuch a perſon to conſider the caſe of ECLIPSES, and with what exactneſs they are calculated. They are not only foretold, but the very inſtant of their beginning is determined—The preciſe time of their continuance is aſcertained; aſcertained almoſt to the nicety of a moment; and, what is ſtill more ſurpriſing, for the ſpace of hundreds or thouſands of years to come.—As this is a matter of fact, abſolutely indiſputable, it is alſo a very obvious, yet ſolid demonſtration, that the principles of ſcience, on which thoſe calculations proceed, are not mere conjecture, or precarious ſuppoſition; but have a real, a certain foundation, in the nature and conſtitution of things.

The great agreement which appears in the ſubſtances and other circumſtances of the Earth, Moon, and other planets, renders it highly probable, that they are all likewiſe inhabited by beings, ſuited to the compoſition and ſituation of thoſe reſpective maſſes.

This piece of mechaniſm alſo ſhews the phænomenon of the tranſit of the planet Venus over the Sun's disk on the ſixth of June, one thouſand ſeven hundred and ſixty-one, when ſhe appeared like a little black patch on the face, though ſhe is nearly as large as our Earth; from whence it is eaſy to judge how immenſely large the Sun muſt be, when a globe of ſeven thouſand nine hundred miles in diameter appeared but a ſpot in it.

It likewiſe ſhews the beginning, middle and ending of that eclipſe of the Sun, which happened on the firſt day of April, one thouſand ſeven hundred and ſixty-four. This is allowed to be the moſt natural repreſentation of an eclipſe that was ever exhibited.

Thus I've the motions taught of Stars above,
Of Sun and Moon, and by what cauſe they move,
And how eclips'd they loſe their gaudy light,
And ſpread o'er all an unexpected night,
As if they wink'd, and then with open eyes
View'd all again, and clear'd the lower ſkies.

Having thus briefly given a deſcription of the aſtronomical part of this magnificent machine, a part which is beheld with equal pleaſure and inſtruction; I ſhall now proceed to mention a few of its remaining beauties, in order to give the reader a farther idea of this excellent piece of art.

A de-

A delightful landſcape is next preſented to view with a proſpect of the ocean. On the ſea, ſhips are ſailing according to true perſpective, their motions, &c. being agreeable to their various diſtances. On the land are coaches, carts and chaiſes, paſſing along, whoſe wheels turn round as if actually on the road; and the perſons, horſes, &c. altering their poſitions, as they aſcend or deſcend a ſteep hill. In the ſame piece, a pleaſant river preſents itſelf near the road, on which there appears a gunpowder-mill at work; and in which river are ſwans ſwimming, fiſhing, and bending their necks backward to feather themſelves; with the diverſion of the dog and duck, &c. In a word, it exhibits an aſtoniſhing diſplay both of deſign and execution; and the beholders generally diſcover more beauties, than we pretend to give any deſcription of.

The next is a very entertaining repreſentation of a carpenter's yard, wherein the various branches of that trade are moſt naturally repreſented. The ſeveral artificers ſeem as though actually at work, and their various attitudes and motions are an accurate reſemblance of life.

At length all the various parts of this machine are at once preſented to the ſpectator's view in motion, when upwards of one thouſand two hundred wheels and pinions move all together: and, during the whole performance, it plays ſeveral fine pieces of muſic on the organ, in a very elegant manner; and the organ is likewiſe provided with a ſet of keys, ſo that thoſe

ladies or gentlemen who chuſe, may play what pieces they pleaſe on it.

Thus have I touched on ſome of the moſt ſtriking beauties of this aſtoniſhing pile of art; which, I will venture to affirm, for elegance of deſign, ſtructure, variety of ſcenes, utility of ſyſtems, harmony, &c. &c. &c. has not its equal. But let it not be thought that THIS, OR ANY deſcription, can give the reader an adequate idea of it; for there are numberleſs beauties to be diſcovered by a diſcerning eye, which words are wanting to expreſs. Nor had the proprietor any other view in publiſhing it, than to give the public a general idea of THE MICROCOSM; to pay a tribute of praiſe to the memory of the late Mr. HENRY BRIDGES, the conſtructor of it; and to make a few moral reflections on the ſyſtems exhibited by this machine.

If the contrivance and ingenuity of the artiſt who compleated the MICROCOSM (or Little World) appears amazing to human apprehenſion, how are we ſtruck with wonder at that Almighty skill which formed the UNIVERSE! which, according to the prophet Iſaiah's noble expreſſion, 'Has meted out the heavens with a ſpan!' If we look upwards to the midnight luminaries *, and ſurvey that infinite multitude

* Soon as the evening ſhades prevail,
The Moon takes up the wond'rous tale,
And nightly to the liſt'ning Earth
Repeats the ſtory of her birth;
Whilſt all the ſtars that round them burn,
And all the planets in their turn,
Confirm the tidings as they roll,
And ſpread the truth from pole to pole.

What

multitude of ſtars *, whoſe magnitudes are aſtoniſhing, and regard them as the ſovereigns of ſo many ſyſtems, each accompanied with his planetary equipage, extending without end beyond one another, all round, and at immenſe diſtances, ranged in the moſt beauteous order, accompanied with ten thouſand times ten thouſand worlds, ſelf-balanced, all in rapid motion! Yet, that none miſtake their way; none fly off from their orbits, into extravagant excurſions; none preſs in upon the centre, with too near an approach; but all their rotations proceed in eternal harmony, keeping ſuch time, and obſerving ſuch laws, as are moſt exquiſitely adapted to the perfection of the whole. What an auguſt! what an amazing conception (if human imagination can conceive

What though, in ſolemn ſilence, all
Move round the dark terreſtrial ball;
What though nor real voice nor ſound,
Amid their radiant orbs be found;
In reaſon's ear they all rejoice,
And utter forth a glorious voice;
For ever ſinging, as they ſhine,
'The hand that made us, is divine.'

* The fixed ſtars ſhine with their own native light, as obſerved before, and are placed at ſuch immenſe diſtances from each other, that they may, with great propriety, be ſuppoſed ſo many ſuns, each affording light, heat and all the other offices of a Sun, to a ſyſtem of habitable planets, thereby making an infinite number of worlds. To ſuch as have not been accuſtomed to think any farther of the univerſe, than as compoſed only of our Earth, with the Moon, ſtars and planets, ſerving only to enlighten and adorn the expanſe of heaven, ſuch philoſophical conjectures as theſe will probably appear extravagantly romantic and imaginary: but a little excurſion into the aſtronomical ſcience, will, in ſome meaſure, leſſen their prejudices, and forbid their condemning them as irrational at leaſt; eſpecially, if they conſider that infinite productions are not incompatible, but rather the neceſſary conſequences of infinite power; we will therefore here conclude, that there are worlds without end.

conceive it) does this afford of the works of the Creator!

> And if through vaſt immenſity we pierce,
> See worlds on worlds compoſe the univerſe;
> Obſerve how ſyſtem into ſyſtem runs,
> What other planets circle other ſuns;

Can we forbear enquiring, Of what were thoſe mighty orbs formed?--Amazing to relate! they were produced without materials. They ſprung from emptineſs itſelf. The ſtately fabrick of univerſal nature emerged out of nothing. A bare Fiat accompliſhed all. LET THEM BE, ſaid GOD. What wonderful force fixes ſome of thoſe vaſt globes on an immoveable baſis! What irreſiſtible impulſe bowls others through the dark profound! And what coercive energy confines their impetuous courſes within the niceſt, ſtricteſt bounds! Nothing but his ſovereign will:

> All are but parts of one ſtupenduous whole,
> Whoſe body nature is, and God the ſoul.
>
> The cloud-capt towers, the gorgeous palaces,
> The ſolemn temples, the great globe itſelf,
> Yea, all which it inherit, ſhall diſſolve;
> And, like the baſeleſs fabrick of a viſion,
> Leave not a wreck behind.

But when we conſider our own ſtate, and the rank we bear in the creation; how rejoiced and grateful ought we to be, when GOD HIMSELF has told us, we are immortal!

15 JY 64

DE-

DESCRIPTIO
MICRO-COSMI.
AD
HENRICUM BRIDGESSUM,
Artificum decus et ſtuporem.

O Cui Dædaleæ naſcenti prodidit Artis
Arridens Natura dolos, operaſque ſuas, quem
Tam prope paſſa Dea eſt impune imitarier unum,
Adſis, O Bridgeſſe; modis, tua Turba, Camænæ
Fac age ſint faciles, et in ordine ſingula pingam,
Percurrens clari ſpectacula Micro-Coſmi.
Fronte licet modica, præſtanti nobilis arte
Stat conſtructa domus, variis quæ fulta columnis
(Quas faber aurata diſtinxit imagine crebra)
Ad quartum erigitur tabulatum, ibi muſica quæque
Inſtrumenta Ædis decorant laquearia ſummæ,
Et faciunt operi pulchro congeſta corollam.
Regia Pygmeadum ſpectantibus eſſe videtur;
Aut quam jactavit celeberrima Lilliput aula.
Prima domi facies errantia Sydera monſtrat,
Æternis medium circumlabentia ſolem
Motibus, et Lunam nativa luce carentem;
Quo pacto ſeſe ſequitur revolubilis annus;
Et quibus immanes orbes parere neceſſe eſt
Legibus, illiſi ne diſſideant: Proprio axe
Volvitur, immenſuſque illuminat omnia Phœbus.
Panditur Aonidum ſuper hæc dulciſſima ſedes,
(Aerias etenim regiones culmina ſummi
Parnaſſi ſuperant, hinc rari numine Divus
Quos agitat puro, citharæ quos ditat honore,
Deſpiciunt humiles terras, et futile vulgus.)
At nova quæ rerum ſpecies, quæ grata ſtupentes
Dulcedo ducit ſenſus? quæ conſona vocum,
Tecta quibus reſonant? aures concordia mulcet.
Hic caſtæ indulgent choreis de more Sorores.
Quæq; Deam ſimulans habituſq; oriſq; nitore:
Carmina pars manibus, pars pectine tentat eburno,
Hæc canit, illius pede conſonat area pulſa.
Ponitur expanſis læva Caducifer alis,
Muſarumque comes ſtat dextra Fama, ſuperne
Pegaſus effrænis circumvolat ardua montis,

Vix

Vix juga calce terens, equiti non ſubditus, ex quo
Popæum dominum rapuerunt aſpera fata.
Mox patet exigui ſcena altera mira Theatri;
Vidimus, audimuſque lyræ modulamine blando
Orphea ducentem Sylvas, et ſaxa, feraſque
Motantur vaſto rupes molimine, ramos
Sylva ſilens nutat, collum ſublime Camelus;
Ad numeros ponit maculas minus horrida Tigris,
Et lepus haud metuens arrectis auribus adſtat;
Tanta ſonis vis eſt! perſuaſio tanta modorum!
Ad quoniam inſtabiles hominum nova gaudia captant
Mentes, terrigenis et ſunt terreſtria cordi;
Hic Micro-Coſmus quas jactat tempus in omne
Deliciis animos oblectat floriferum ver:
Cujus ad adventum caveas cita linquit hirundo
Excuſſo ſomno ſemeſtri, et paſcua verrit;
Præſcia venturi rediviva inſecta ſalutant;
Atque tono coccyx comitatur ſemper eodem;
Lætantur pecudes, nidos meditantur aves, quas
Ad teneros calor invitat genialis amores.
Nec vir abeſt terris (durum genus) incola, ſunt qui
Dum vivos ſimulant mentito corpore motus
Multiplices hominum curas imitantur et artes.
Aſpice clivoſo pendente in tramite curru
Ut cavet auriga, et laxis inſiſtit habenis,
Mox deſcendentis volitat vi pronior axis.
Labitur hinc tacitus cygnis decorantibus amnis,
Inde tumet, ſpumaſque molis cogentibus albet;
Et veluti ventis dant turgida vela ſecundis
Quæ procul undivagæ monſtrantur in æquore puppes.
Deniq; ſit qui habet tellus ſpectabile, ſi quid
Æther dulce tenet, ſi vaſta quid æquora, vivis
Expreſſum tabulis fixi dum vidimus, arte
Eſt dubium Phydiæ faber an ſuperavit Apellis.
Quæ claudit ſcenam, (quid enim niſi ſcena vocatur
Orbis terraqueus?) ſe materiaria pandit
Fabrica parvorum artificum, ſua quiſque laboris
Inſtrumenta tenet, locus eſt et regula cuique
Malleolo hic lignum et membra fatigat, at ille
Exacuit ſcalprum, et falſum ficto ore renidet.
Mordetur ſerra trabs hinc, gemit inde ſecuri;
Sic, ſi parva licet magnis componere, claſſem
Quando terribilem parat indignatio Regis,
Inſtruit arma cito, lætumque Britannica pubes
Urget opus, Gallis meditans ſeu vincula Iberis,
Fit fragor et multo ſervet Navale labore.

FINIS.

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